What is claimed is:

1. A heteropolymeric compound comprising a chain of monomeric nucleosides, nucleoside analogs, abasic nucleosides, or heterocyclic derivatives thereof, wherein each of said nucleosides, nucleoside analogs, abasic nucleosides, or heterocyclic derivatives thereof is pharmaceutically active and said nucleosides, nucleoside analogs, abasic nucleosides or heterocyclic derivatives thereof are linked by a phosphodiester group comprising a 3' or 5' terminal moiety, phosphorothioate group, or H-, alkyl or alkenyl phosphonate group.

2. The compound of claim 1, wherein said nucleosides are selected from the group consisting of adenosine, 5-azacytidine, cladribine, cytarabine, doxifluridine, enocitabine, floxuridine, fludarabine, gemcitabine, pentostatin, brivudine, edoxudine, fiacitabine, fialuridine, ibacitabine, idoxuridine, ribavirin, trifluridine and vidarabine.

3. The compound of claim 1, wherein said nucleoside analogs are carbacylic analogs or L-nucleosides.

4. The compound of claim 1, wherein said nucleoside analogs are selected from the group consisting of acyclovir, valacyclovir, penciclovir, famciclovir, ganciclovir, cidofovir, adefovir, lobucavir and ribavirin.

5. The compound of claim 1, wherein said nucleobases are selected from the group consisting of mercaptopurine, thioguanine and azathioprine.

6. The compound of claim 1, wherein said chain comprises from 2 to 100 monomeric nucleoside, nucleoside analogs, abasic nucleosides or heterocyclic derivatives thereof.

7. The compound of claim 1, wherein at least one of said nucleosides, nucleoside analogs, abasic nucleosides or heterocyclic derivatives thereof are antiviral.

8. The compound of claim 1, wherein at least one of said nucleosides, nucleoside analogs, abasic nucleosides or heterocyclic derivatives thereof is pharmaceutically active against cancer.

9. The compound of claim 1, wherein at least one of said nucleosides, nucleoside analogs, abasic nucleosides or heterocyclic derivatives thereof are antimicrobial.

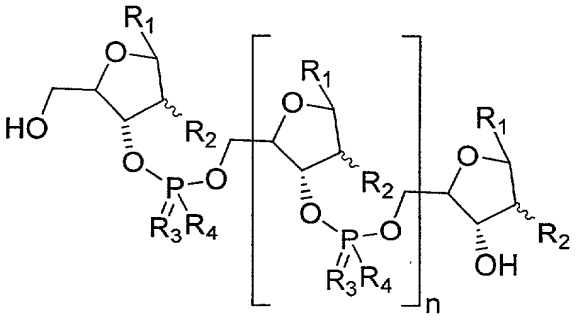
10. A method of treating a viral infection in a patient in need thereof, said method comprising administering an effective amount of a compound of claim 7.

11. A method of treating cancer in a patient in need thereof, said method comprising administering an effective amount of a compound of claim 8.

12. A method of treating a microbial infection in a patient in need thereof, said method comprising administering an effective amount of a compound of claim 9.

13. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier.

14. A heteropolymeric compound of general formula (I)



wherein R^1 is optionally present and if present is independently selected from the group consisting of a pharmaceutically active nucleoside, nucleoside analog or heterocyclic derivative thereof;

R^2 is present in the β or α face and is independently selected from the group consisting of hydrogen, O-R^5, R^5, N-R^5R^6, N_3, X, or S-R^5; wherein R^5 and R^6 are independently selected from the group consisting of hydrogen, C_1-C_{35} alkyl, $C_{2\text{-}35}$ alkenyl, $C_{3\text{-}35}$ cycloalkyl, $C_{1\text{-}35}$ alkoxy, $C_{1\text{-}35}$ alkylamino, $C_{2\text{-}35}$ ether, $C_{2\text{-}35}$ thioether, aryl, $C_{6\text{-}35}$ non-aromatic heterocyclic, or a heteroaryl;

X is Cl, Br, F, or I;

R^3 is independently selected from the group consisting of O or S;

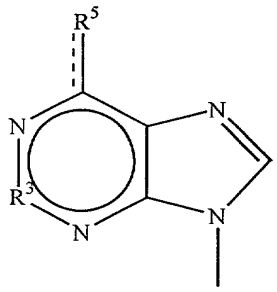
wherein when R^3 is S, R^4 is O^- and when R^3 is O, R^4 is selected from the group consisting of $C_{1\text{-}5}$ alkyl , $C_{1\text{-}5}$ alkenyl and O^-;

wherein said alkyl, alkenyl, cycloalkyl, alkoxy, alkenyloxy, aryl, non-aromatic heterocyclic or hteroaryl are optionally substituted with one or more substituents selected from the group consisting of halogen, hydroxy, amino, acyloxy and carboxy.

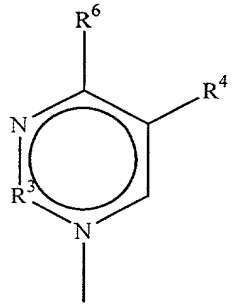
n is an integer from 1-100;

or a pharmaceutically acceptable salt thereof.

15. The compound of claim 14, wherein R^1 is selected from the group consisting of



or



R^3 is CH, C=O, C=S or NH_2;

R^4 is H, C_{1-35} alkyl, C_{2-35} alkenyl, C_{3-35} cycloalkyl, C_{1-35} alkoxy, C_{1-35} alkenyloxy, C_{1-35} alkylamino, C_{2-35} ether, C_{2-35} thioether, aryl, C_{6-35} non-aromatic heterocyclic or heteroaryl;

R^5 is O, S or NH_2; and

R^6 is H, C=O, C=S, NH_2, NHR^7, or SR^7, wherein R^7 is selected from the group consisting of C_{1-35} alkyl, C_{2-35} alkenyl, C_{3-35} cycloalkyl, C_{1-35} alkoxy, C_{1-35} alkenyloxy, C_{1-35} alkylamino, C_{2-35} ether, C_{2-35} thioether, aryl, C_{3-35} non-aromatic heterocyclic or heteroaryl;

wherein said alkyl, alkenyl, alkenyloxy, cycloalkyl, alkoxy, aryl, non-aromatic heterocyclic and heteroaryl are optionally substituted with one or more substituents selected from the group consisting of halogen, hydroxy, amino, acyloxy and carboxy.

16. The compound of claim 14, wherein each R^1 is selected from

the group consisting of nucleoside analogs.

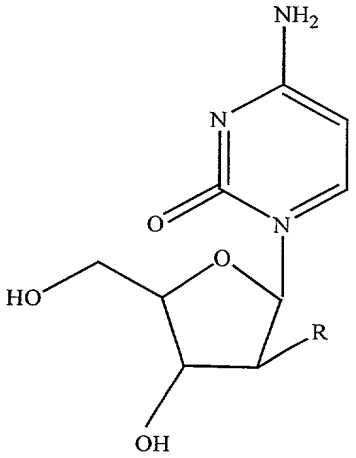
17. The compound of claim 14, wherein said nucleoside analog is an acyclic, monocyclic or polycyclic moiety.

18. The compound of claim 14 wherein each R^4 is O-.

19. The compound of claim 14, wherein R^1 is independently selected from the group consisting of optionally substituted adenine, guanine, cytosine, uracil and thymine or a heterocyclic base derivative thereof.

20. The compound of claim 14, wherein each R^1 is independently selected from the group consisting of adenine, cytosine, 2,6-diaminopurine, 2-chloroadenine, 6-mercaptopurine, thioguanine, 5-Fluorouracil and 2-Fluoroadenine.

21. A compound of general formula II

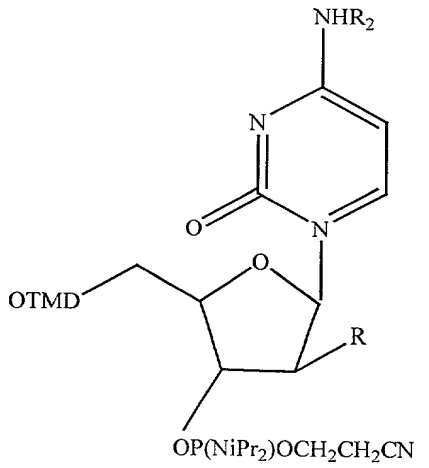


wherein R is selected from the group consisting of a C_{1-35} alkyl, C_{1-35} alkenyl, C_{3-35} cycloalkyl, C_{1-35} alkoxy, C_{1-35} alkylamino, C_{2-35} ether, C_{2-35} thioether, C_{2-35} alkenyloxy, aryl, C_{6-35} non-aromatic heterocyclic, or heteroaryl;

wherein said alkyl, alkenyl, cycloalkyl, alkoxy, alkenyloxy, aryl, non-aromatic heterocyclic and heteroaryl are optionally substituted with one or more substituents selected from the group consisting of halogen, hydroxy, amino, acyloxy and carboxy.

22. The compound of claim 21, wherein R is $-OCH_2CH_2OCH_3$..

23. A compound of general formula III



wherein R^2 is –C(O)R wherein R is independently selected from the group consisting of C_{1-35} alkyl, C_{3-35} cycloalkyl, C_{1-35} alkoxy, C_{1-35} alkylamino, C_{2-35} ether, C_{2-35} thioether, C_{2-35} alkenyl, C_{2-35} alkenyloxy, aryl, a C_{6-35} non-aromatic heterocyclic, and heteroaryl;

wherein said alkyl, alkenyl, cycloalkyl, alkoxy, aryl, non-aromatic heterocyclic and heteroaryl are optionally substituted with one or more substituents selected from the group consisting of halogen, hydroxy, amino, acyloxy and carboxy.

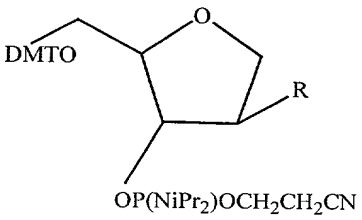
24. The compound of claim 23, wherein R is alkoxy.

25. The compound of claim 23, wherein R is-$OCH_2CH_2OCH_3$.

26. The compound of claim 21, appended singly or as multimers or as groups of multimers to an oligonucleotide or analog at the 3'-, 5'- or at both termini .

27. The compound of claim 23, appended singly or as multimers or as groups of multimers to an oligonucleotide or analog at the 3'-, 5'- or at both termini .

28. A compound of general formula (IV)



wherein R is selected from the group consisting of hydrogen, C_{1-35} alkyl, C_{2-35} alkenyl, C_{3-35} cycloalkyl, C_{1-35} alkoxy, C_{2-35} alkenyloxy, C_{1-35} alkylamino, C_{2-35} ether, C_{2-35} thioether, aryl C_{6-35} non-aromatic heterocyclic, and heteroaryl.

29. The compound of claim 28, wherein R is methyl or ethyl.

30. The compound of claim 29, wherein R is methyl.

31. The compounds of claim 28 wherein R is $OCH_2CH_2OCH_3$..